Trump Tariffs and Roundabout Trade†

By TADASHI ITO*

Although there are many news articles of tariff dodging via the re-routing of made-in-China goods through third countries, relabeling these goods as made in Mexico or made in Vietnam, there have been no scientific studies on this issue. This paper provides statistical evidence regarding whether such practices are taking place. Using monthly trade statistics at the most disaggregated level and analyzing data up to 2019, the year before the COVID-19 shock, little evidence of roundabout trade is found. With an extended dataset up to 2023, overall there is little sign of roundabout trade, although some slight signs of roundabout trade are found for Mexico and Vietnam.

I. Introduction

It is without doubt that one of the largest unexpected shocks in international trade over the past 20–30 years was the launch of a trade war against China by former United States (US) President Donald Trump. Many academic papers have shown that Trump's tariffs substantially reduced Chinese exports to the US. On the other hand, some reports suggest that artful dodging of the Trump tariffs took place through, as one example, a strategy known as roundabout trade, or detour trade.[1] When goods are exported to final destination countries via third countries to circumvent export embargos on the destination countries or to avoid high import tariffs imposed by the final destination countries, such exports are referred to as roundabout or detour trade. Many news articles[2] have suggested that Chinese goods navigated alternate trade routes to the US; in other words, exporters used third countries to bypass the Trump tariffs. However, these news articles are short of hard evidence supported by robust scientific analysis. This study will investigate this issue through scientific methods, intending to investigate whether or not roundabout trade is prevalent, i.e., if there are general signs of roundabout trade for many countries, rather than examining particular cases of roundabout trade. To this end, monthly trade data at the highly disaggregated product level is used, as such data are available for many countries for the appropriate period to investigate the issue. Admittedly, to identify roundabout trade precisely, firm-level export/import data are needed, but these data are available only under strict conditions of use and only for certain countries. Moreover, this information is typically unavailable for recent years.

As shown in Table 1, Trump's tariffs against China covered a wide range of products. More than 60% of HS 8-digit product lines were targeted by the Trump administration with a substantial import duty rate of 25%. Thus, the effects of Trump's tariffs on US-China trade and the subsequent impact on world trade have been a hot subject investigated by many trade economists over the past few years. Many academic papers show a substantial decrease in Chinese exports of Trump-targeted goods to the US. Some studies show that several other US partner countries increased their exports to the US at the expense of China. On the other hand, some studies suggest that China appears to have increased its exports to other countries even more than it reduced its exports to the US. Specifically, it seems that China in fact expanded its exports of Trump-targeted goods to the world (Ito, 2022a). One potential explanation is that China may have genuinely increased its exports to third countries through policy changes by the Chinese government, such as the export VAT refund. Another potential explanation is tariff dodging, as mentioned above. This study investigates tariff dodging through roundabout trade, as it has captured much attention from the media and the public.

---

[1]This paper uses the terms 'roundabout trade' and 'detour trade' interchangeably.
[2]See, for example, https://asia.nikkei.com/Spotlight/Datawatch/Chinese-goods-navigate-alternate-trade-routes-to-US-shores or https://edition.cnn.com/2022/12/02/politics/china-solar-tariff-investigation-climate/index.html.

TABLE 1—OVERVIEW OF TRUMP TARIFFS

	List 1	List 2	List 3
Date of the executive orders being effective	6 June 2018	23 July 2018	1st: 24 September 2018 2nd: 10 May 2019
The purpose of the trade act	China's laws, politics, practices or actions may be unreasonable or discriminatory and may be harming American intellectual property (IP) rights, innovation, or technology development.		
Relevant U.S. domestic law	Section 301 of the Trade Act of 1974		
The number of targeted items*	818	279	5745
Ad valorem duties	25%	25%	1st:10% 2nd:25%
The characteristics of targeted items*	High value-added products (industrial equipments)	Industrial products e.g. (plastics, semiconductors, railway parts)	Consumer products e.g. (home appliances, chemical products, textile products)

Note: Targeted goods are defined at HS 8-digit. The total number of HS 8-digit goods is 11300. Source: Author's elaboration from the (USTC)'s official announcement. See the reference for the URL.

A. *Literature*

Previous studies focusing on this topic, although not necessarily exhaustive, found mostly negative impacts of Trump's tariffs on the US economy. Using difference-in-difference estimations, Amiti, Redding, and Weinstein (2019) and Amiti, Redding, and Weinstein (2020) showed substantially negative effects of Trump's tariffs on Chinese exports to the US. More specifically, the US tariffs are almost entirely borne by US firms and consumers (no terms of trade effect). A substantial redirection in trade in response to the 2018 tariffs took place. A 10% tariff is associated with approximately a 10% drop in imports for the first three months, but this elasticity doubles in magnitude in subsequent months. Amiti, Redding, and Weinstein (2019) showed that the cumulative deadweight welfare cost (reduction in real income) from the US tariffs was around $8.2 billion in 2018. In an event study estimation, Fajgelbaum et al. (2020) showed that the US import values of Trump-listed goods from targeted countries decreased by 31.7%, whereas the US total import values for Trump-listed goods, irrespective of the import partner country (regardless of whether the import partners were subject to the Trump tariffs or not) decreased by 2.5%. US firms and consumers who bought Trump-listed imported goods suffered US$51 trillion in real income losses, equivalent to 0.27% of US gross domestic product (GDP). The sum of this loss for US firms and consumers plus the increase in consumer surplus (due to a slight decrease in the border price) and tariff revenues resulted in a loss of US$7.2 trillion, equivalent to 0.04% of US GDP. Studying the tariff pass-through at the levels of US retailers and consumers, Cavallo et al. (2021) also showed findings similar to those by the studies above, most notably the complete pass-through of the Trump tariffs to US domestic prices. For consumer goods such as washing machines, handbags, and refrigerators, they found that the tariff burden fell completely on retailers, not consumers, as they found that the retail prices of these goods did not change.

Trump's tariffs against China had discernible impacts on the Chinese economy. Chor and Li (2021), using satellite readings of night-time luminosity, showed that

locations within China that were more exposed to the US tariffs experienced a greater decrease in night light intensity, pointing to contracted local economic activity. Cui and Li (2021) showed that the US import tariff hikes were associated with relative reductions in Chinese new firm entry rates. He, Mau, and Xu (2021) found that firms that were relatively more exposed to US tariffs in 2019 responded by posting fewer job advertisements in the six months following the tariff increase. The reduction amounted to 2.4%–3.2% fewer advertisements on average per firm.

Trump's tariffs against China affected third countries as well. Using information at the tariff-line level on sanctions and retaliations and encapsulating this information in a general equilibrium framework featuring imperfect competition, recursive dynamics, and global value chains (MIRAGE-e V2), Bellora and Fontagné (2020) found that, consistent with political economy determinants, these twists of value added were transmitted to production factors, leading to sizeable creation and destruction of jobs and the reallocation of capital to the benefit of protected sectors, mostly at the expense of their clients. Regarding the effects on the activities of Japanese firms, Sun et al. (2019) using information on the activities of Japanese multinationals in China, showed that Chinese affiliates, especially those with high exposure to trade with North America, in general saw a decline in sales after the trade war began. Ito (2022a) found that Trump's tariffs against China substantially decreased US imports from China, whereas many US import partner countries increased their exports to the US at the expense of China, in a kind of trade diversion effect. The study also found that whilst there was no sign of a decrease in border prices of US imports from China (no terms of a trade improvement), US imports from other partner countries of Trump-listed goods (targeting China) showed a decrease in their border price. Ito (2022b) showed that there was no increase in Japan's import values/quantities of Trump-targeted goods from China, finding however that the import price decreased slightly. Surprisingly and contrary to a priori expectations, it was also found that Japanese industries that are linked as upstream industries of China's (downstream) industries subjected to Trump's tariffs increased their exports to China. To investigate the reason for this unexpected result, the analysis focused on China's exports of Trump tariff-targeted goods to the world and found that China increased its exports of those goods to the world. Specifically, the increase in China's exports to countries other than the US more than offset the decrease in its exports to the US. On the other hand, somewhat contrary to Ito's (2022b) finding, Hayakawa et al. (2022) argued that the decrease in China's output exports to the US caused by the Trump tariffs reduced China's input imports from supplier economies, especially from Taiwan.

Tariff dodging by trade through third countries may explain the above-mentioned seemingly increasing exports of Trump-tariff goods from China to countries other than the US. This study investigates whether there is evidence of such roundabout trade using large and detailed trade statistics. Iyoha et al. (2024) presented the same research question in their study. Using Vietnamese customs data at the firm level, they showed that 16.1% of Vietnamese exports to the US were identified as having gone through product-level rerouting, whereas only 1.8% were flagged as having been through firm-level rerouting. This study differs from the work of Iyoha et al. (2024) in the following ways. First, the present study examines evidence of roundabout trade not only for Vietnam but also for nearly all potential rerouting

countries. Second, it uses a different definition of roundabout trade. Iyoha et al. (2024) defines trade as roundabout trade when the same HS 8-digit products are imported to Vietnam and exported to the US. This definition is too loose because it is well known that there is substantial two-way trade even among the same HS 8-digit products, mainly owing to product varieties and vertical intra-industry trade. Unlike Iyoha et al. (2024), this study controls for intra-industry trade and thus more precisely defines roundabout trade. The definition of roundabout trade employed in this study is described in the following section. Given the lack of firm-level export and import data for many countries that could be involved in roundabout trade, this study attempts to investigate the issue by using export and import data at the most detailed product level.

II. Data and methodologies

A. *Definition of roundabout trade*

As mentioned in the introduction section, when goods are exported to final destination countries via third countries to circumvent export embargos on the destination countries or to avoid high import tariffs imposed by the final destination countries, such exports are termed roundabout trade or detour trade. There can be many ways in which roundabout trade is accomplished. For example, a Chinese firm can set up its affiliate (foreign direct investment) in, for instance, Vietnam, import goods from the headquarters in China, and re-export them to the US. Or, a firm in a bypass country, such as Vietnam, can import goods from China and then re-export them to the US. In the latter case, the Vietnamese firm in the middle is the one that engages in roundabout trade. The Chinese firm that exported the goods to the Vietnamese firm is unaware of the re-exporting from Vietnam. When goods are exported through third countries that have free trade agreements (FTAs) with the US, such as Canada or Mexico, FTA tariff rates may or may not be applied. When US importers apply for certain FTA tariff rates, they need to show what is known as a rules of origin certificate. However, legitimately relabeling 'made in China' to 'made in Mexico' and thus making the goods eligible for FTA tariffs incurs a relatively high cost because Mexican firms in the middle must engage in some processing of the products. On the other hand, the benefits gained by the use of FTA rates are relatively small because the gap between the most favored nation (MFN) rates and FTA rates is not substantial, usually only a few percent, such as an MFN rate of 3% and an FTA rate of 0%. As the Trump tariffs were mostly 25%, the benefit gained by roundabout trade changed little between MFN imports and FTA imports. Given this cost-benefit perspective, many firms most likely did not have much incentive to apply to use FTA rates. As mentioned in the introduction section, with trade data only, it is impossible precisely to identify roundabout trade. Instead, this paper aims to deduce whether there are general signs of roundabout trade by studying the unusually rapid increase of imports from China and the simultaneously rapid increase of exports to the US of Trump tariff goods compared to non-Trump tariff goods.

B. *Data source*

To investigate this issue, we use monthly trade data at the Harmonized System (HS) 6-digit level taken from the Global Trade Atlas. Given the extremely large sample size, which reaches tens of millions of observations, we focus on the major trade partner countries of the US and China that may have engaged in roundabout trade. More specifically, first we obtain yearly export and import data at the HS 6-digit level for the 20 countries that are the top US import partner countries as well as the top Chinese export partner countries. These countries are, in alphabetical order, Belgium, Brazil, Canada, France, Germany, India, Indonesia, Italy, Japan, Malaysia, Mexico, Netherlands, Philippines, the Republic of Korea (henceforth, Korea), Russia, Singapore, Spain, Thailand, the United Kingdom, and Vietnam. Then, by making graphs of these countries' imports from China and exports to the US, we choose seven countries (Canada, India, Malaysia, Mexico, the Philippines, Korea, and Vietnam) as potential bypass routes for Trump-targeted goods. We obtain monthly trade data pertaining to these seven countries from the Global Trade Atlas.

The list of Trump-targeted goods is taken from official announcements by the Office of the United States Trade Representative (USTR). As shown in Table 1, more than half of products are targeted by Trump tariffs.

C. *Methodology*

As noted in section 2.1, the unusually rapid increase in imports from China and the simultaneous rapid increase in exports to the US of Trump tariff goods compared with non-Trump tariff goods is a sign of roundabout trade. The following is the estimation equation we employ to identify whether roundabout trade took place:

$$lnExp_{ymjp} = \beta_0 + \beta_1 lnImp_{ymip} + \beta_2 lnImp_{ymip} * RoundaboutDummy$$
$$+ \alpha_{ymij} + \alpha_{yijp} + \alpha_{mijp} + \varepsilon_{ymijp}$$

In this equation, y, m, i, j, and p represent the year, month, import partner, export partner, and product, respectively. Note that we estimate the equation according to each reporter country, such as Mexico, Canada, or Vietnam, to determine if the reporter country in question appears to have engaged in roundabout trade of the Trump-targeted goods. The covariate, $lnImp_{ymip}$, captures the association between the import value of the reporter country (e.g., Malaysia) of good p from country i to the corresponding export value of the same good p. The expected sign is positive because when the production of good (or industry) p in the reporter country (e.g., Malaysia) is expanded, the expansion brings about both imports of intermediate goods and exports of processed goods classified in the same category p. In other words, by including this covariate, we can control for general intra-industry trade, which is one of the differences between Iyoha et al. (2024) and this study. *RoundaboutDummy* takes a value of 1 if imports are from China (i =China)

and exports are to the US (j =US), and p denotes Trump targeted goods. Thus, the cross-term $lnImp_{ymip} * RoundaboutDummy$ accounts for roundabout trade; α is the term representing fixed effects. We include full fixed effects to identify roundabout trade correctly. We estimate the equation with full fixed effects as above for the period of January 2016 to June 2019, which sufficiently covers before and after the Trump tariff shock. Out of the selected countries mentioned above, we especially focus on Canada, Mexico, and certain Asian countries. Canada and Mexico were chosen because they are both included in the United States-Mexico-Canada Agreement and have no import duties and thus are potential stopover places for roundabout trade. The Asian countries selected here are also potential stopover places owing to their proximity to China and to their large and regular export flows to the US. To clarify our identification strategy with regard to the estimation equation above, a sketch of the identification strategy is shown in Figure A1, and a sketch of the data structure is shown in Figure A2 in the appendix. To address potential endogeneity further, estimations using lagged explanatory variables were conducted.

III. Descriptive analyses

Figure 1 shows Canada's imports from China and exports to the US of non-Trump-targeted goods (the left panel) and Trump-targeted goods (the right panel). If roundabout trade had been taking place through Canada, the import values from China and the export values to the US of the Trump-targeted goods should have both picked up from around August–November 2018, when the Trump tariffs kicked in. Meanwhile, the export and import values of non-Trump-targeted goods should not have increased as much as the Trump-targeted goods. A casual observation of the figures does not suggest the presence of roundabout trade through Canada.

FIGURE 1. CANADA'S IMPORTS FROM CHINA AND EXPORTS TO THE US OF NON-TRUMP-TARGETED GOODS AND TRUMP-TARGETED GOODS

Source: Author's elaboration from the trade data.

Figure 2 presents the case for Vietnam. Both imports from China and exports to the US increased steadily over the sample period. However, it is not clear if the increase is larger for Trump-targeted goods than non-Trump-targeted goods. Figure 3 is the case for Malaysia. Trump-targeted goods appear to have increased both imports from China and exports to the US compared to non-Trump-targeted goods, but it is not clear. We have drawn the figures for all countries in question and have not found a clear sign of roundabout trade.[3]

FIGURE 2. VIETNAM'S IMPORTS FROM CHINA AND EXPORTS TO THE US OF NON-TRUMP-TARGETED GOODS AND TRUMP-TARGETED GOODS

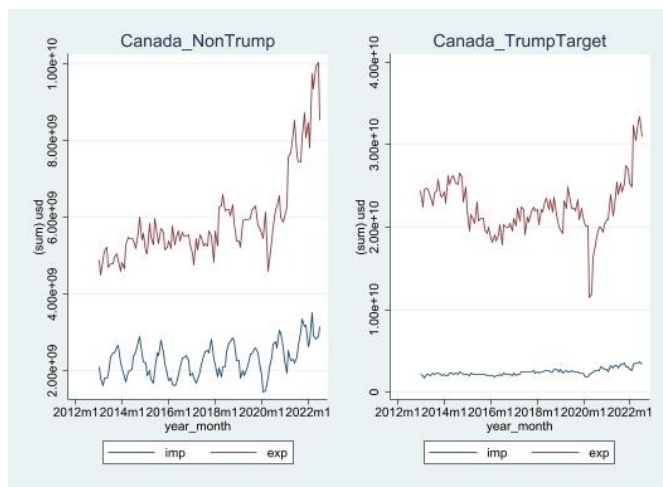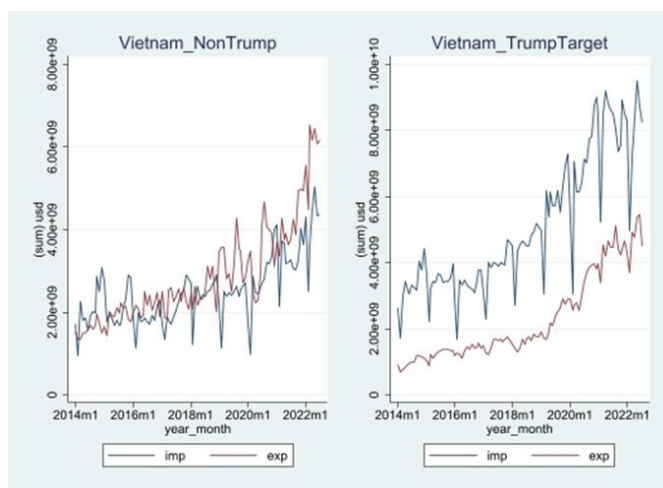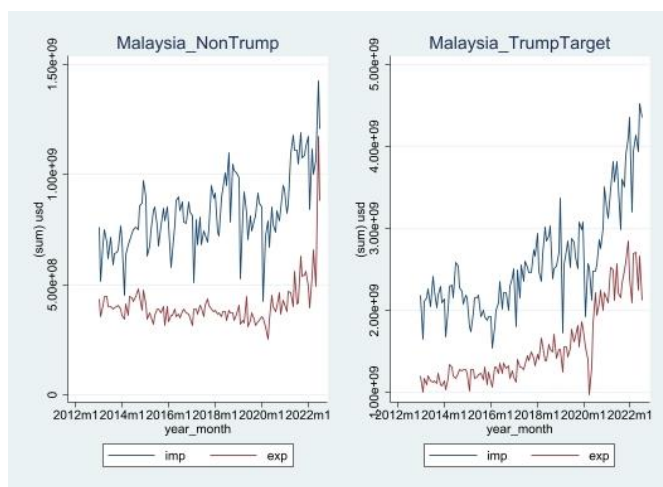*Source*: Author's elaboration from trade data.

FIGURE 3: MALAYSIA'S IMPORTS FROM CHINA AND EXPORTS TO THE US OF NON-TRUMP-TARGETED GOODS AND TRUMP-TARGETED GOODS

Source: Author's elaboration from trade data.

[3]Due to space limitations here, the figures for the other countries are not shown but are available on request.

To observe for which types of products dubious cases of roundabout trade are taking place, we extracted products that meet three criteria. The first criterion is that both imports from China and exports to the US increased by more than or equal to US$1 million to abstract away trade in minor (low trade value) goods. The second criterion is that the gap between increases in the export value to the US and the import value from China is within 20%, as the increased import amount from China should in general match the increased export amount to the US if such trade is roundabout trade. The third criterion is that both imports and exports more than doubled because both imports from China and exports to the US should have increased substantially if the increased trade is roundabout trade. An explanation using numerical examples is in the appendix. Table 2 shows the number of HS 6-digit code items that meet the three criteria within the corresponding HS 2-digit code items.[4] Table 3 presents a description of each HS 2-digit code. By country, the numbers for Canada, India, and Korea are relatively large. By produce code, '84: Machinery and mechanical appliances, boilers, nuclear reactors; parts thereof' and '85: Electrical machinery and equipment and parts thereof' are relatively large.

TABLE 2—DUBIOUS CASES OF ROUNDABOUT TRADE

hs2	Reporter							
	Canada	India	Malaysia	Mexico	Philippines	Korea	Viet Nam	Total
	No.	No.	No.	No.	No.	No.	No.	No.
3	1	0	0	0	0	1	0	2
20	0	0	0	0	0	1	0	1
25	1	0	0	0	0	0	0	1
28	1	2	0	0	0	0	0	3
29	1	2	0	0	0	1	0	4
33	0	0	0	0	0	0	1	1
34	0	0	1	0	0	0	0	1
37	0	0	0	0	0	0	0	0
38	0	0	1	0	0	0	0	1
39	1	1	1	0	0	3	1	7
40	1	3	1	0	0	0	0	5
42	0	0	0	0	0	0	0	0
44	0	1	2	0	1	0	0	4
48	1	1	1	1	0	0	0	4
56	0	0	0	1	0	1	0	2
60	1	0	0	0	0	0	0	1
68	0	0	0	1	0	1	0	2
69	1	0	0	0	0	0	0	1
70	0	2	0	0	0	0	0	2
73	0	0	0	0	0	0	0	0
74	0	2	0	0	0	1	0	3
75	0	0	0	0	0	0	0	0
82	0	0	0	0	0	1	0	1
83	0	0	0	0	0	0	0	0
84	4	5	1	1	1	3	1	16
85	1	3	3	0	0	2	2	11
86	0	1	0	0	0	0	0	1
87	0	0	0	0	1	0	0	1
90	0	0	0	1	2	0	1	4
94	0	1	0	0	0	0	0	1
Total	14	24	11	5	5	15	6	80

Source: Author's elaboration from the trade data.

[4]The argument for relaxing the third criterion to a 50% increase is presented in the appendix (Table A1).

TABLE 3—DUBIOUS CASES OF ROUNDABOUT TRADE, HS 2-DIGIT CODE DESCRIPTION

Code	Description	Total Number of HS 6-digit Codes	Number of HS 6-digit Codes Meeting the 3 Criteria	Percentage
03	Fish and crustaceans, molluscs and other aquatic invertebrates	224	2	0.9%
20	Preparations of vegetables, fruit, nuts or other parts of plants	52	1	1.9%
25	Salt, sulphur, earths, stone, plastering materials, lime and cement	68	1	1.5%
28	Inorganic chemicals, organic and inorganic compounds of precious metals; of rare earth metals, of radio-active elements and of isotopes	174	3	1.7%
29	Organic chemicals	385	4	1.0%
33	Essential oils and resinoids, perfumery, cosmetic or toilet preparations	29	1	3.4%
34	Soap, organic surface-active agents, washing, lubricating, polishing or scouring preparations, artificial or prepared waxes, candles and similar articles, modelling pastes, dental waxes and dental preparations with a basis of plaster	23	1	4.3%
37	Photographic or cinematographic goods	30	0	0.0%
38	Chemical products n.e.c.	92	1	1.1%
39	Plastics and articles thereof	129	7	5.4%
40	Rubber and articles thereof	80	5	6.3%
42	Articles of leather, saddlery and harness, travel goods, handbags and similar containers, articles of animal gut (other than silk-worm gut)	20	0	0.0%
44	Wood and articles of wood; wood charcoal	103	4	3.9%
48	Paper and paperboard; articles of paper pulp, of paper or paperboard	101	4	4.0%
56	Wadding, felt and nonwovens, special yarns, twine, cordage, ropes and cables and articles thereof	30	2	6.7%
60	Fabrics; knitted or crocheted	44	1	2.3%
68	Stone, plaster, cement, asbestos, mica or similar materials; articles thereof	49	2	4.1%
69	Ceramic products	30	1	3.3%
70	Glass and glassware	64	2	3.1%
73	Iron or steel articles	124	0	0.0%
74	Copper and articles thereof	50	3	6.0%
75	Nickel and articles thereof	17	0	0.0%
82	Tools, implements, cutlery, spoons and forks, of base metal; parts thereof, of base metal	64	1	1.6%
83	Metal; miscellaneous products of base metal	36	0	0.0%
84	Machinery and mechanical appliances, boilers, nuclear reactors, parts thereof	516	16	3.1%
85	Electrical machinery and equipment and parts thereof, sound recorders and reproducers; television image and sound recorders and reproducers, parts and accessories of such articles	265	11	4.2%
86	Railway, tramway locomotives, rolling-stock and parts thereof, railway or tramway track fixtures and fittings and parts thereof, mechanical (including electro-mechanical) traffic signalling equipment of all kinds	23	1	4.3%
87	Vehicles, other than railway or tramway rolling stock, and parts and accessories thereof	87	1	1.1%
90	Optical, photographic, cinematographic, measuring, checking, medical or surgical instruments and apparatus; parts and accessories	144	4	2.8%
94	Furniture, bedding, mattresses, mattress supports, cushions and similar stuffed furnishings, lamps and lighting fittings, n.e.c.; illuminated signs, illuminated name-plates and the like; prefabricated buildings	42	1	2.4%

Source: Author's elaboration from the trade data.

IV. Estimation analyses

The estimation results of the equation above are shown in Table 4. Given the length of time to run the estimations, as mentioned above, owing to the extremely large numbers of fixed effects, we limit the period to January 2016–December 2019, which still sufficiently covers the pre- and post-Trump tariff periods. We also use only the top 30 import and export partners for the reporter country in question, i.e., (1) Canada, (2) India, and others. If roundabout trade has taken place, the variables of interest, detour (roundabout), should show statistically significant coefficients with positive signs. Here, however, the estimation results show statistically insignificant coefficient estimates, meaning that is no clear evidence of roundabout trade.

TABLE 4—ESTIMATION RESULTS OF ROUNDABOUT TRADE

Variables	(1) Canada	(2) Indonesia	(3) Malaysia	(4) Mexico	(5) Singapore	(6) Korea	(7) Thailand	(8) Viet Nam	(9) India	(10) Philippines
ln_imp_val	0.000809* (0.000403)	0.000237 (0.000530)	0.00342*** (0.000455)	0.00166*** (0.000407)	0.00475*** (0.000302)	0.000630* (0.000294)	0.000859** (0.000321)	-0.000113 (0.000364)	0.000736* (0.000362)	-0.000917 (0.000999)
roundabout (detour)	0.000870 (0.00136)	0.00332 (0.00525)	-0.00165 (0.00331)	0.00216 (0.00213)	0.00306 (0.00405)	-0.00105 (0.00258)	-0.000285 (0.00363)	0.00555 (0.00459)	0.00256 (0.00286)	-0.0162* (0.00750)
Month*Importer dummy*Exporter dummy *Product dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year*Importer dummy*Exporter dummy *Product dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
year*month importer dummy *Exporter dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	14,439,626	7,585,136	9,261,981	13,933,028	18,528,624	17,320,517	20,968,602	12,959,211	16,224,897	2,389,201
R-squared	0.887	0.879	0.903	0.897	0.892	0.899	0.890	0.900	0.855	0.871

Robust standard errors in parentheses.
***$p<0.001$, ** $p<0.01$, * $p<0.05$.

Source: Author's estimation using the trade data.

As there may be some time lags in roundabout trade, i.e., goods are imported from China and then exported to the US, we estimate the same equation but with a one-month lagged detour (roundabout). These results, shown in Table 5, are qualitatively similar to those in Table 4.

TABLE 5—ESTIMATION RESULTS OF ROUNDABOUT TRADE, LAGGED EXPLANATORY VARIABLES

Variables	(1) Canada	(2) Indonesia	(3) Malaysia	(4) Mexico	(5) Singapore	(6) Korea	(7) Thailand	(8) Viet Nam	(9) India	(10) Philippines
ln_imp_val_l1	0.000402 (0.000473)	-0.00115 (0.000617)	0.00212*** (0.000531)	0.00189*** (0.000467)	0.00324*** (0.000345)	0.000750* (0.000338)	0.00110** (0.000364)	0.000106 (0.000422)	0.00188*** (0.000430)	-0.00109 (0.00120)
roundabout (detour)	0.000693 (0.00132)	0.00365 (0.00509)	-0.00123 (0.00324)	0.00244 (0.00198)	0.000333 (0.00399)	-0.00131 (0.00242)	0.000186 (0.00347)	0.00324 (0.00485)	0.000378 (0.00272)	-0.0152* (0.00746)
Month*Importer dummy*Exporter dummy *Product dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year*Importer dummy*Exporter dummy *Product dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year*month*Importer dummy *Exporter dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	10,242,462	5,187,435	6,468,080	10,286,497	13,792,895	13,009,570	15,555,337	9,340,382	11,385,893	1,526,537
R-squared	0.897	0.889	0.911	0.910	0.902	0.906	0.900	0.908	0.865	0.882

Robust standard errors in parentheses.
***p<0.001, p<0.01, * p<0.05.

Source: Author's estimation using the trade data.

V. Extended period

The above analysis intentionally constrained the period of analysis to January 2016–December 2019 to avoid contamination by the effect of COVID-19 and to lessen the computational burden. However, as we have data available for the post-COVID-19 period, this section provides the same estimation analyses including the most recently available data, specifically data from January 2016 to August/September 2023.[5] In 2020, the Trump administration added additional products to the Trump tariffs. The Biden administration did not lift the Trump tariffs, but there were some changes to the list. Table 6 presents an outline of the Trump tariffs for the extended period.

TABLE 6—OVERVIEW OF TRUMP TARIFFS, EXTENDED PERIOD

	List 1	List 2	List 3	List 4A
Date of the executive orders being effective	6 June 2018	23 July 2018	1st: 24 September 2018 2nd: 10 May 2019	1 September 2019
The purpose of the trade act	China's laws, politics, practices, or actions may be unreasonable or discriminatory and may be harming American intellectual property (IP) rights, innovation, or technology development.			
Relevant US domestic law	Section 301 of the Trade Act of 1974			
The number of targeted items*	818	279	5745	3805
Ad valorem duties	25%	25%	1st: 10% 2nd: 25%	25%
The total number of exempted items**	266	76	476	109
The ratio of exempted items to target items	33%	27%	8%	3%
The date of the first exemption	28 December 2018	31 July 2019	28 October 2019	10 March 2020
The number of exemption phases	12	7	18	10
The characteristics of targeted items*	High value-added products (industrial equipments)	Industrial products e.g., plastics, semiconductors, and railway parts	Consumer products e.g., home appliances, chemical products, and textile products	Consumer products e.g., mobile phone, laptop, toy, and video game

Note: Targeted goods are defined at HS 8-digit. The total number of HS 8-digit goods is 11300.

**: Author's counting of the exempted items at HS 8-digit. (USTR defines exempted items by HS 10-digit.)

Source: Author's elaboration from Office of the United States Trade Representative (USTR)'s official announcement. See the reference for the URL.

List 4A became effective whereas List 4B did not come into force.

[5] Some countries report trade statistics up to August of 2023, whereas others report up to September of 2023.

The estimation results for the extended period are given in Table 7. With the extended period, there are some signs of roundabout trade for Mexico and Vietnam.

The difference between the benchmark estimation results and the estimation results with the extended period suggests that over time, traders learn how to dodge the Trump tariffs. For example, they start small and then gradually expand their operation. Or looking at others' roundabout trade, new entrants may join the business. Another possibility is that with a few years of a preparation period, Chinese firms can set up a subsidiary in Vietnam or Mexico to engage in roundabout trade.

TABLE 7—ESTIMATION RESULTS OF ROUNDABOUT TRADE, EXTENDED PERIOD OF JANUARY 2016–AUGUST/SEPTEMBER 2023

Variables	(1) Canada	(2) Indonesia	(3) Malaysia	(4) Mexico	(5) Singapore	(6) Korea	(7) Thailand	(8) Viet Nam	(9) India	(10) Philippines
ln_imp_val	0.00203*** (0.000258)	0.000816* (0.000327)	0.00459*** (0.000295)	0.00207*** (0.000264)	0.00593*** (0.000196)	0.00110*** (0.000192)	0.00223*** (0.000207)	0.00150*** (0.000225)	0.00237*** (0.000228)	0.000346 (0.000596)
roundabout (detour)	-6.41e-05 (0.000669)	-0.00184 (0.00253)	-0.000688 (0.00171)	0.00315** (0.00107)	0.000220 (0.00204)	-0.000502 (0.00127)	0.00218 (0.00180)	0.00593** (0.00222)	0.000618 (0.00144)	-0.00652 (0.00339)
Month*Importer dummy*Exporter dummy *Product dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year*Importer dummy*Exporter dummy *Product dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year*month*Importer dummy *Exporter dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	29,733,641	17,111,492	20,113,226	28,466,069	38,308,678	36,835,355	42,851,383	29,603,811	34,885,217	5,436,975
R-squared	0.866	0.859	0.884	0.877	0.872	0.881	0.870	0.883	0.831	0.857

Robust standard errors in parentheses.
***$p<0.001$, ** $p<0.01$, * $p<0.05$.

Source: Author's estimation using the trade data.

The estimation results with the lagged dependent variable are shown in Table 8. Mexico shows some signs of roundabout trade, but no such signs were found for the other countries.

TABLE 8—ESTIMATION RESULTS OF ROUNDABOUT TRADE, LAGGED EXPLANATORY VARIABLES, LAGGED EXPLANATORY VARIABLES, EXTENDED PERIOD OF JANUARY 2016–AUGUST/SEPTEMBER 2023

Variables	(1) Canada	(2) Indonesia	(3) Malaysia	(4) Mexico	(5) Singapore	(6) Korea	(7) Thailand	(8) Viet Nam	(9) India	(10)
In_imp_val_11	0.00121*** (0.000305)	0.000160 (0.000377)	0.00269*** (0.000343)	0.00175*** (0.000305)	0.00425*** (0.000223)	0.000988*** (0.000220)	0.00213*** (0.000234)	0.000801** (0.000260)	0.00234*** (0.000269)	0.000963 (0.000707)
roundabout (detour)	-0.000513 (0.000643)	-0.00210 (0.00246)	-0.00225 (0.00169)	0.00302** (0.000987)	0.00136 (0.00199)	0.00135 (0.00120)	0.00304 (0.00172)	0.00417 (0.00236)	-0.000606 (0.00135)	-0.00636 (0.00337)
Month*Importer dummy*Exporter dummy *Product dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year*Importer dummy*Exporter dummy *Product dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year*month*Importer dummy *Exporter dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	20,921,748	11,750,770	13,918,666	20,954,094	28,573,562	27,763,360	31,700,846	21,521,132	24,581,119	3,483,215
R-squared	0.877	0.869	0.892	0.891	0.883	0.888	0.881	0.892	0.842	0.869

Robust standard errors in parentheses.
***p<0.001,** p<0.01, * p<0.05.

Source: Author's estimation using the trade data.

VI. Another estimation model as a robustness check

As a robustness check, I estimate the following estimation equation. In this equation, I exclude imports from the explanatory variables.

$$lnExp_{ymjp} = \beta_0 + \beta_1 * RoundaboutDummy + \alpha_{ymij} + \alpha_{yijp} + \alpha_{mijp} + \varepsilon_{ymijp}$$

These estimation results are shown in Table 9. As in the earlier estimation analyses, Vietnam shows some signs of roundabout trade.

TABLE 9—ESTIMATION RESULTS OF ROUNDABOUT TRADE, EXTENDED PERIOD OF JANUARY 2016–AUGUST/SEPTEMBER 2023, EXCLUDING IMPORT VALUES FROM THE EXPLANATORY VARIABLES

Variables	(1) Canada	(2) Indonesia	(3) Malaysia	(4) Mexico	(5) Singapore	(6) Korea	(7) Thailand	(8) Viet Nam	(9) India	(10) Philippines
roundabout (detour)	-0.000964 (0.00962)	-0.0326 (0.0347)	-0.0273 (0.0242)	0.0201 (0.0154)	0.00639 (0.0282)	-0.00707 (0.0187)	0.0233 (0.0252)	0.0740* (0.0300)	-0.0141 (0.0197)	-0.0950* (0.0449)
Month*Importer dummy*Exporter dummy *Product dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year*Importer dummy*Exporter dummy *Product dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year*month*Importer dummy *Exporter dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	29,733,641	17,111,492	20,113,226	28,466,069	38,308,678	36,835,355	42,851,383	29,603,811	34,885,217	5,436,975
R-squared	0.866	0.859	0.884	0.877	0.872	0.881	0.870	0.883	0.831	0.857

Robust standard errors in parentheses.
***p<0.001, ** p<0.01, * p<0.05.

Source: Author's estimation using the trade data.

VII. Estimation for dubious product categories

I estimate the same model for the dubious product categories shown in Table 2, with the results shown in Table 10. There are no signs of roundabout trade in this case.

TABLE 10—ESTIMATION RESULTS OF ROUNDABOUT TRADE, JANUARY 2016–AUGUST/SEPTEMBER 2023, FOR THE DUBIOUS PRODUCT CATEGORIES

Variables	(1) Canada	(2) Indonesia	(3) Malaysia	(4) Mexico	(5) Singapore	(6) Korea	(7) Thailand	(8) Viet Nam	(9) India	(10) Philippines
ln_imp_val	0.000402	0.00136	0.00419***	-0.00406	0.00362***	0.000386	0.00232***	0.00131*	0.000648	-0.000616
	(0.000694)	(0.00271)	(0.000698)	(0.00313)	(0.000831)	(0.000530)	(0.000571)	(0.000572)	(0.000603)	(0.00239)
detour	-0.00110	0.0540	0.00158	0.00106	-0.0161	-0.00125	0.00915	0.00685	-0.00560	0.0224
	(0.00176)	(0.0318)	(0.00332)	(0.0121)	(0.0118)	(0.00340)	(0.00487)	(0.00482)	(0.00401)	(0.0130)
Month*Importer dummy*Exporter dummy *Product dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year*Importer dummy*Exporter dummy *Product dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year*month*Importer dummy *Exporter dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	4,974,631	305,491	3,612,156	274,647	1,999,790	5,122,192	5,377,603	4,605,108	5,221,874	414,326
R-squared	0.828	0.857	0.909	0.916	0.882	0.855	0.865	0.897	0.805	0.859

Robust standard errors in parentheses.
*** $p<0.001$, **$p<0.01$, * $p<0.05$.

Source: Author's estimation using the trade data.

VIII. Conclusion

Although there are many news articles about tariff dodging by re-routing made-in-China goods through third countries and relabeling them as made in Mexico or made in Vietnam, there have been no scientific studies of this issue. This paper provides hard evidence pertaining to whether such practices are taking place. The analyses of the data up to 2019, the year before the COVID-19 shock, show little evidence of roundabout trade. With the extended dataset up to 2023, while overall there is little sign of roundabout trade, there are some slight signs of roundabout trade for Mexico and Vietnam. The policy relevance of this study is substantial because the Trump tariffs are one of the largest shocks of the past 20–30 years in international trade and thus had a significant impact on the world economy. Out of the many effects of the Trump tariffs, tariff dodging is one of the important issues requiring clarification.

APPENDIX

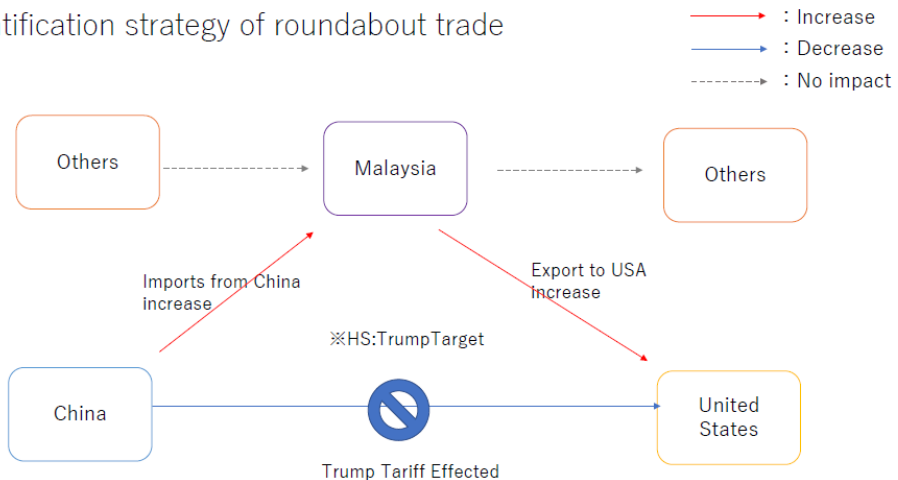FIGURE A1. SKETCH OF THE IDENTIFICATION STRATEGY

Source: Author.

Estimation equation

$$lnExp_{ymjp} = \beta_0 + \beta_1 lnImp_{ymip} + \beta_2 lnImp_{ymip} * RoundaboutDummy + \alpha_{ymij} + \alpha_{yijp} + \alpha_{mijp} + \varepsilon_{ymijp}$$

year	month	reporter	HS	Trump Tariff	Trump Effective	import_partner	imp_val	Export_partner	expval	ExpUSA_ ImpCHN_dummyc	Roundabout dummy
2016	1	MYS	111111	0	0	CHN	10	USA	10	1	0
2016	1	MYS	111111	0	0	JPN	20	USA	10	0	0
2016	1	MYS	111111	0	0	CHN	10	CHN	30	0	0
2016	1	MYS	111111	0	0	CHN	10	CAN	20	0	0
2016	1	MYS	111111	0	0	JPN	20	CAN	20	0	0
2016	1	MYS	111111	0	0	JPN	20	JPN	10	1	0
2016	1	MYS	111112	1	0	CHN	10	USA	10	1	0
2016	1	MYS	111112	1	0	JPN	20	USA	10	0	0
2016	1	MYS	111112	1	0	CHN	10	CHN	40	0	0
2016	1	MYS	111112	1	0	CHN	10	CAN	20	0	0
2016	1	MYS	111112	1	0	JPN	20	CAN	20	0	0
2016	1	MYS	111112	1	0	JPN	20	JPN	30	0	0
2019	1	MYS	111112	1	1	CHN	10	USA	10	1	1
2019	1	MYS	111112	1	1	JPN	20	USA	10	0	0
2019	1	MYS	111112	1	1	CHN	10	CHN	20	0	0
2019	1	MYS	111112	1	1	CHN	10	CAN	20	0	0
2019	1	MYS	111112	1	1	JPN	20	CAN	20	0	0
2019	1	MYS	111112	1	1	JPN	20	JPN	10	0	0

Trump Tariff = 1 if HS code is Trump tariff goods.
TrumpEffective = 1 if Trump Tariff = 1 & year month is after the effective month of Trump tariffs, i.e., August, or September 2018.
Roundabout dummy = 1 when ExpUSA_ImpCHN_dummy = 1 & TrumpEffective =1.

FIGURE A2. DATA STRUCTURE

From the trade statistics, I constructed all combinations of export partners and import partners for each HS code. The first line shows that the reporter country (MYS (Malaysia)) imported US$10 million of HS 111111 goods from China and exported US$10 million of the same HS 111111 goods to the US. The TrumpTariff dummy takes a value of 1 if the good is on the Trump tariff list (irrespective of the partner country). In the example, HS 111112 is on the Trump tariff list; thus, the TrumpTariff dummy takes a value of 1. TrumpEffective takes a value of 1 if the good is on the Trump tariff list and the year and month are after the time when the Trump tariff became effective. The ExpUSA_ImpCHN_dummy takes a value of 1 if the export partner is the US and the import partner is China. The Roundabout dummy takes a value of 1 if both the ExpUSA_ImpCHN_dummy and TrumpEffective are 1. With this data structure and the above estimation equation, $\beta_2 lnImp_{ymip} * RoundaboutDummy$ picks up the roundabout trade.

Appendix for the three conditions in section 3
Condition 1: Increase in both the export value to the US and the import value from China by more than or equal to US$1 million
Condition 2: The gap between increases in export value to the US and import value from China is within 20%.*
Condition 3: Both imports and exports more than doubled.**

Imports from China				Exports to US				Gap	Constraints		
Imports before	Imports after	Increase or decrease	Growth(X)	Exports before	Exports after	Increase or decrease	Growth(Y)	US increase/ China increase	Condition 1	Condition 2	Condition 3
10	110	100	10	30	130	100	3.33333333	1=100/100	○	○	○
1000	1100	100	0.1	3000	3100	100	0.03333333	1=100/100	○	○	-

 * : 0.8 < Y/X < 1.2
** : Growth > 1 (Both China and US)

TABLE A1—DUBIOUS CASES OF ROUNDABOUT TRADE WITH BROADER CRITERIA

hs2	Reporter										Total
	Canada	India	Indonesia	Malaysia	Mexico	Philippines	Singapore	Korea	Thailand	Viet Nam	
3	1	0	0	0	0	0	0	1	0	0	2
8	0	0	0	0	0	0	0	0	1	0	1
16	0	0	0	0	0	0	0	0	1	0	1
17	0	1	0	0	0	0	0	0	0	0	1
19	0	0	0	0	0	1	1	0	0	0	2
20	0	0	0	0	0	0	0	1	0	0	1
21	0	0	0	0	0	1	0	1	0	0	2
22	0	0	0	0	0	0	0	1	0	0	1
25	1	0	0	0	0	0	0	0	0	0	1
28	1	3	0	0	0	0	0	1	0	0	5
29	2	4	0	0	0	0	0	3	0	0	9
32	0	1	1	0	0	0	0	0	0	0	2
33	0	0	0	0	0	0	0	0	0	1	1
34	0	0	0	1	0	0	1	0	0	0	2
37	0	0	0	0	0	0	1	0	0	0	1
38	1	1	2	1	0	0	0	0	0	0	5
39	1	3	0	2	2	0	3	7	2	2	22
40	1	4	1	1	0	0	0	0	0	0	7
42	0	0	2	0	0	1	0	1	0	0	4
44	0	2	0	3	0	1	0	0	2	0	8
48	1	1	0	1	1	0	0	0	0	0	4
54	0	0	0	1	0	0	0	0	0	0	1
56	0	0	0	1	1	0	0	1	0	0	3
60	1	0	0	0	0	0	0	0	0	0	1
68	1	0	0	0	1	0	0	1	0	0	3
69	2	0	0	0	0	0	0	0	0	0	2
70	1	2	0	0	0	0	0	0	0	0	3
73	1	1	0	0	0	1	1	1	5	0	10
74	0	3	0	0	0	0	0	1	1	0	5
75	0	1	0	0	0	0	1	0	0	0	2
76	0	1	0	0	0	0	0	0	0	0	1
82	0	1	0	0	0	0	0	2	0	0	3
83	1	0	0	0	0	0	1	0	1	0	3
84	4	9	1	2	4	1	5	6	4	1	37
85	1	6	3	6	0	0	4	2	2	2	26
86	0	1	0	0	0	0	1	0	0	0	2
87	0	0	1	0	0	1	1	0	2	0	5
90	0	0	0	1	1	2	1	2	1	1	9
94	0	1	1	0	0	2	0	1	0	1	6
Total	21	46	12	20	10	11	21	33	22	8	204

Source: Author's elaboration from the trade data.

REFERENCES

Amiti, M., S.J. Redding, and D.E. Weinstein. 2019. "The Impact of the 2018 Tariffs on Prices and Welfare," *Journal of Economic Perspectives*, 33(4):187-210.

Amiti, M., S.J. Redding Stephen, and D.E. Weinstein. 2020. "Who's Paying for the US Tariffs? A Longer-Term Perspective," *AEA Papers and Proceedings*.

Cavallo, A., G. Gopinath, B. Neiman, and J. Tang. 2021. "Tariff Pass-through at the Border and at the Store: Evidence from US Trade Policy," *American Economic Review Insights*, 3(1), March.

Bellora, C. and L. Fontagné. 2020. "Shooting Oneself in the Foot? Trade War and Global Value Chains," *CEPII Working Paper*, No. 2019-18. CEPII.

Chor, D. and B. Li. 2021. "Illuminating the Effects of the US-China Tariff War on China's Economy," *NBER Working Paper* No. 29349. Cambridge, MA: NBER.

Cui, C. and L. S.-Z. Li. 2021. "The Effect of the US-China Trade War on Chinese New Firm Entry," *Economics Letters* 203, 109846.

Fajgelbaum, P.D., P.K. Goldberg, P.J. Kennedy, and A.K. Khandelwal. 2020. "The Return to Protectionism," *Quarterly Journal of Economics*, 135(1): 1-55.

Hayakawa, K., J.H. Pyun, N. Yamashita, and C. Yang. 2022. "Ripple Effects in Global Value Chains: Evidence from an Episode of the US–China Trade War," *IDE Discussion Papers* No.853. IDE.

He, C., K. Mau, and M. Xu. 2021. "Trade Shocks and Firms Hiring Decisions: Evidence from Vacancy Postings of Chinese Firms in the Trade War," *Labour Economics*, 71, Article 102021.

Ito, T. 2022a. "Third Country Effects of Trump Tariffs: Which Countries Benefited from Trump's Trade War?," *RIETI Discussion Paper Series* 22-E-007. RIETI.

Ito, T. 2022b. "The Effects of Trump's Trade War on Japan's Trade," *RIETI Discussion Paper Series* 22-E-019. RIETI.

Iyoha, Ebehi, Edmund Malesky, Jaya Wen, Sung-Ju Wu, and Bo Feng. 2024. "Exports in Disguise?: Trade Rerouting during the US-China Trade War," Harvard Business School.

Office of the United States Trade Representative (https://ustr.gov/about-us/policy-offices/press-office/fact-sheets/2018/june/section-301-investigation-fact-sheet).

Sun C., Tao. Z., Yuan H., and Zhang H. 2019. 'The Impact of the US-China Trade War on Japanese Multinational Corporations', RIETI Discussion Paper Series 19-E-050. RIETI.

United States Trade Representatives (https://ustr.gov/about-us/policy-offices/press-office/fact-sheets/2018/june/section-301-investigation-fact-sheet).

United States Trade Representatives. Section 301(https://ustr.gov/issue-areas/enforcement/section-301-investigations/section-301-china/investigation).